(USA) The Not So Short Introduction to Health Care

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President: George W. Bush

- In 2004, US President George W. Bush launched an initiative to make electronic medical records available to most Americans within the next 10 years (by 2014).
- “By computerizing health records, we can avoid dangerous medical mistakes, reduce costs, and improve care.”
  - President George W. Bush, State of the Union Address, January 20, 2004

GDP & Health Care Spending

- “Health spending in 2006 is projected at $2.1 trillion, which accounts for 16 percent of the gross domestic product.”

- Cited From:
  John A. Poisal, Christopher Truffer, Sheila Smith, Andrea Sisko, Cathy Cowan, Sean Keehan, Bridget Dickensheets, and National Health Expenditures Team
  Health Spending Projections Through 2016: Modest Changes Obscure Part D's Impact
  Health Affairs Web Exclusive, February 21, 2007

- “The health share of gross domestic product (GDP) is expected to hold steady in 2006 before resuming its historical upward trend, reaching 19.6 percent of GDP by 2016.”

Define Health Care

- “Health care includes, but is not limited to preventive, diagnostic, therapeutic, rehabilitative, maintenance, mental health or palliative care and sale or dispensing of a drug, device, equipment or other item in accordance with a prescription.”
  - Retrieved from: www.dpw.state.pa.us/General/HIPPAPrivacy/003670787.htm on February 24, 2007 using Google Definition.

Definitions in Care - 1

- Care Giver: Healthcare professional; family member or friend who attends to the needs of a patient; who helps in identifying or preventing or treating illness or disability. (Provider of Care)

- Care Taker: Patient; a person who requires medical assistance. (If covered by an insurance policy: Insured)

Definitions in Care - 2

- Health Insurance: “A contractual relationship whereby an insurance company (the insurer) agrees to reimburse the insured for health care costs in exchange for a premium. The contract (policy) generally stipulates the type of health care benefits covered as well as costs to be reimbursed.”
  - Retrieved from www.valleyhealth.biz/glossary.html on February 24, 2007 using Google Dictionary.
- Co-pay: “An arrangement where the insured pays a specified amount for various services and the health carrier (insurance company) pays the remaining charges.”
  - Retrieved from www.kellerlowry.com/glossary/glossary_c.htm on February 24, 2007 using Google Dictionary.

Definitions in Care - 3

- Prescription: “Written instructions (usually sent via Fax / Electronically) from a physician to a pharmacy / druggist concerning the form and dosage of a drug to be issued to a given patient.”
  - Retrieved from http://wordnet.princeton.edu/perl/webwn on February 24, 2007 using Google Dictionary.
- Claim: The formal request by a policyholder or claimant for payment of loss under an insurance policy.
  - Retrieved from www.apmc.us/IndustryGlossary on February 24, 2007 using Google Dictionary.

Definitions in Care - 3

- Clearing House: “A public or private entity that processes or facilitates the processing of nonstandard data elements of health information into standard data elements. (HIPAA, Subtitle F, Section 262(a) Section 1171(2))”
  - Retrieved from www.hipaabasics.com/glossary.htm on February 24, 2007 using Google Dictionary.

Start of Transaction

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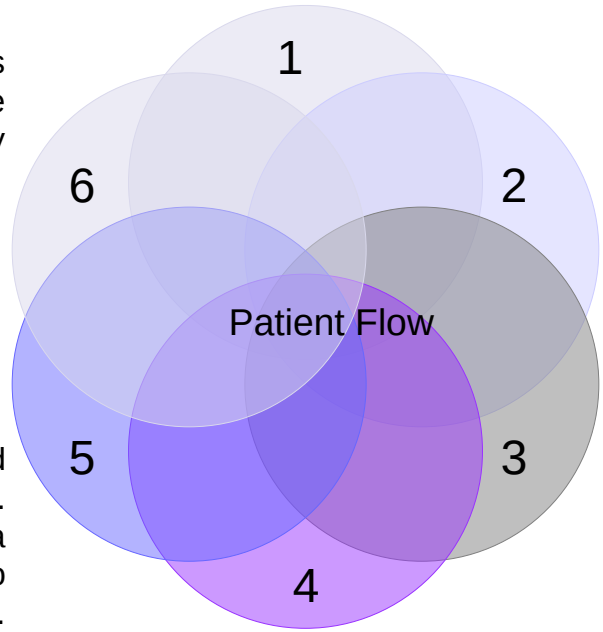
Patient Flow



* Schedule an Appointment

* Front Office (Collects Personal & Insurance Details. Co-pay may be Collected Upfront.)
*In Exam Room: Medical Assistant collects Vitals, Allergy info., Current Medications.

*Doctor Examines the Patient, Orders Labs, X-Rays, Prescribes Medication

* Relevant Patient Data is Recorded in the Patient's Chart.
* Patient Schedules a Follow-up Appointment.

* Co-pay may be Paid before Leaving.
* Billing Staff Creates a Claim and Sends it to Insurance Company.

* The Doctor Receives the Payment from the Insurance Company

Schedule an Appointment

- Patient Calls the practice to schedule an appointment.

Front Office

- Patient arrives at the Doctors practice
- Front Office Staff collects patients information including:
  - Is this the first visit?
  - Personal Information (including Family / Social History)
  - Insurance Details
- Front Office Staff may collect Co-payment upfront
- Staff verifies patient information and determines:
  - If insurance is still active
  - The type of insurance coverage

Exam Room

- Medical assistant collects:
  - Vital information: Blood Pressure, Height, Weight etc.
  - Current Medications (if any)
  - Allergies (if any)
  - Brief description of why the patient is here to see the doctor.

Doctor

- Doctor examines the patients previous records (if any)
- Doctor examines the patient
- Doctor (may) order lab work / diagnostic tests (X-Rays, etc) to be performed on the patient
- Doctor orders a medication for the patient and submits it (electronically or by fax)

Electronic Prescription Flow

New Prescription:

- Patient needs prescription
- Patient meets with Doctor
- Doctor/Staff enters Rx into their system
- Electronic Prescription is routed by a third party agent (like SureScripts) to patient's pharmacy of choice.
- Prescription is received by Pharmacy software and dispensed to the patient.

Renewal:

- Patient needs prescription
- Patient requests refill from pharmacy
- If needed Pharmacist (from their system) sends "renewal" request to doctor
- Third party agent (like SureScripts) delivers request electronically to doctors office
- Doctor or office staff approve request
- Pharmacy software receives authorization and dispenses the medication to the patient.

Lab or Diagnostic Test

- Lab (e.g. HgA1c).
- Diagnostic Test (e.g. X-Ray)
- Patient often has to go to another facility to have the test performed
- Test orders are submitted to and received by the lab company
- Electronic communication between the doctor's office and the lab is possible

Chart

- Doctor / Staff: Relevant Patient Data is Recorded in the Patient's Chart.
- Chart may contain the following but is not limited to:
  - Chief Complaint
  - History of Present illness (HPI)
  - Current Medication
  - Past Medical History
  - Surgical History
  - Allergies
  - Hospitalization
  - Review of Systems (ROS)
  - Vital Signs
  - Examination

Follow Up Appointment

- Front Office Staff schedules a Follow Up Appointment (if needed)
- A patient may or may not have insurance.
  - Patient has insurance: Co-payment may be Paid before Leaving.
  - Patient does not have insurance: Patient usually pays the charges before leaving or the billing person mails them a statement.
- Patient Leaves the Doctors Office.

Billing (If Patient has Insurance)

- Billing Staff Creates a Claim
- Billing Staff reviews the Claim data before sending it to the Insurance Company.
- Billing Staff sends the claim (usually electronically) to the Insurance Company.

Insurance

- Often, insurance companies only cover a portion of the services provided by the doctor to the patient.
- The Insurance company processes the claims and renders the necessary Claim Amount to the doctor.
- Doctor’s Billing Staff posts the payment received to the system to show the amount collected.

Miscellaneous Transactions

- During this whole process there may be multiple instances where in:
  - the patient calls the doctor;
  - doctor receives faxes from pharmacy / patient;
  - lab / diagnostic results are received by the doctor;
  - messages are exchanged by the doctor and the patient
- All the (above) transactions are recorded and are attached to the patients chart.

End of Transaction

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Electronic Health Records

- “An Electronic Health Record (EHR) is a medical record or any other information relating to the past, present or future physical and mental health, or condition of a patient which resides in computers which capture, transmit, receive, store, retrieve, link, and manipulate multimedia data for the primary purpose of providing health care and health-related services.”
  - Retrieved from: http://en.wikipedia.org/wiki/EHR on February 24, 2007 using Google Definition.

What is the need for EHR?

- "Every year 98,000 patients die due to preventable medical errors in the business process of care.

  That's equivalent to a 747 crashing every day, killing all aboard. If hospitals were airlines, would you fly?"

  - John D. Halamka, MD, CIO, Harvard Medical School

- Medical errors may result in:
  - A patient inadvertently given the wrong medicine.
  - A clinician misreading the results of a test.
  - An elderly woman with ambiguous symptoms (shortness of breath, abdominal pain, and dizziness) whose heart attack is not diagnosed by emergency room staff.
    - Retrieved from: http://www.ahrq.gov/research/errors.htm EHR on February 24, 2007.

How do errors occur?

Errors can occur at any point in the health care delivery system:

- **Medication Errors**
  - These are preventable mistakes in prescribing and delivering medication to patients, such as prescribing two or more drugs whose interaction is known to produce side effects or prescribing a drug to which the patient is known to be allergic.
- **Surgical Errors**
- **Diagnostic Inaccuracies**
  - Incorrect diagnoses may lead to incorrect and ineffective treatment or unnecessary testing, which is costly and sometimes invasive. Also, inexperience with a technically difficult diagnostic procedure can affect the accuracy of the results.
- **System Failures**
  - Although errors in medication, surgery, and diagnosis are the easiest to detect, medical errors may result more frequently from the organization of health care delivery and the way that resources are provided to the delivery system.

  - Retrieved from: http://www.ahrq.gov/research/errors.htm EHR on February 24, 2007.

Key Attributes of an EHR

- Workflow automation
- Rapid and organized access to clinical data
- Multi-user concurrent access
- Flexibility in data entry
- Decision support capability
- Error prevention
- Reporting capability
- Compliance with regulations and laws
- Robust architecture
- Technically sound platform

Perceived Benefits Of Electronic Health Records (EHRs) To The Practice, 2005

EXHIBIT 4
Perceived Benefits Of Electronic Health Records (EHRs) To The Practice, 2005

Benefit to the practice	Mean rating
Improved access to medical record information	4.60
Improved workflow	4.49
Improved patient communications	4.28
Improved accuracy for coding evaluation and management procedures	4.28
Improved drug refill capabilities	4.21
Reduced medication errors	4.19
Improved charge capture	4.16
Improved clinical decision making	4.15
Improved claim submission process	4.13
Reduced medical records staff expenses	3.96
Reduced medical records storage costs	3.92
Reduced transcription costs	3.92
Reduced medical records transportation costs	3.64
Improved physician recruitment	3.31

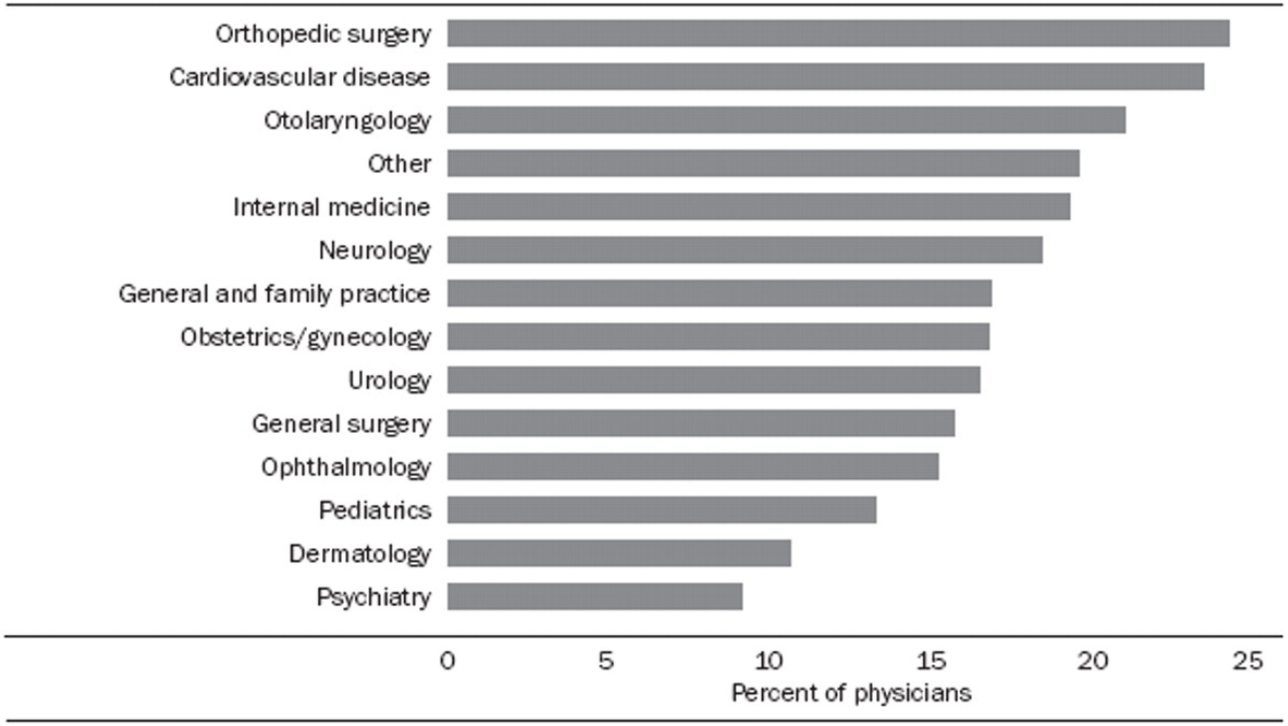
SOURCE: The information in this exhibit is derived from the authors' own analyses.

NOTE: Based on a five-point scale ranging from 1 (no value) to 5 (very important value).

Cited From: Gans D, Kralewski J, Hammons T and Dowd B.
Medical Groups' Adoption Of Electronic Health Records And Information Systems
Health Affairs, Vol 24, Issue 5, 1323-1333

Percentage Of Office-Based Physicians Using EHR, By Specialty

EXHIBIT 2
Percentage Of Office-Based Physicians Using Electronic Medical Records, By Specialty, 2001–2003



SOURCE: U.S. Centers for Disease Control and Prevention, National Center for Health Statistics, National Ambulatory Medical Care Survey, 2001–2003.

Cited From: Catharine W. Burt and Jane E. Sisk,
Which Physicians And Practices Are Using Electronic Medical Records?,
Health Affairs, Vol 24, Issue 5, 1334-1343

Barriers To Implementing Electronic Health Records (EHRs), 2005

EXHIBIT 5
Barriers To Implementing Electronic Health Records (EHRs), 2005

Barrier	Mean rating: Practices with EHRs	Mean rating: Practices without EHRs	Mean rating: All practices responding
Lack of support from practice physicians	3.32	3.15	3.18
Lack of capital resources to invest in an EHR	3.31	3.58	3.54
Concern about physicians' ability to input into the EHR	3.18	3.40	3.37
Concern about loss of productivity during transition to EHR	3.04	3.24	3.21
Inability to easily input historic medical record data into EHR	2.97	3.24	3.20
Available EHR software does not meet the practice's needs	2.77	2.81	2.81
Insufficient return on investment from EHR system	2.74	3.15	3.09
Lack of support from practice clinical staff	2.73	2.43	2.48
Insufficient time to select, contract, install, implement EHR	2.70	2.88	2.86
Lack of support from practice nonphysician providers	2.68	2.31	2.37
Inability to integrate EHR with practice billing/claims system	2.67	2.90	2.87
Practice staff does not have skills or training to use EHR	2.65	2.62	2.63
Inability to evaluate, compare, and select appropriate EHR	2.60	2.86	2.82
Lack of support from practice administration	2.43	2.06	2.12
Security and privacy concerns	2.31	2.34	2.34

SOURCE: The information in this exhibit is derived from the authors' own analyses.
NOTE: Based on a five-point scale ranging from 1 (not a problem) to 5 (makes implementation very difficult).

Cited From: Gans D, Kralewski J, Hammons T and Dowd B.
Medical Groups' Adoption Of Electronic Health Records And Information Systems
Health Affairs, Vol 24, Issue 5, 1323-1333

Personal Health Record

- “Personal health records are electronic summaries of a patient's medical record that are often portable and easily accessed by the patient.”

- Retrieved from http://www.aafp.org/fpm/20060500/57anin.html on February 24, 2007.

Various Models of PHR

- One version of personal health records is a provider-owned digital summary that patients can access but cannot change.
- A second model is a patient-owned program patients can use to enter and organize their health information.
- The third model is a portable digital file that can be transferred between computers and that corresponds closely to the Continuity of Care Record standard.

Retrieved from http://www.aafp.org/fpm/20060500/57anin.html on February 24, 2007.

PHR Uses

- Personal health records empower patients by allowing them to monitor their health data.
- Personal health records have the potential to improve patient-provider relationships, patient safety and quality of care.

Retrieved from http://www.aafp.org/fpm/20060500/57anin.html on February 24, 2007.

NHIN

- Nationwide Health Information Network (NHIN)
- “National Health Information Network describes the technologies, standards, laws, policies, programs and practices that enable health information to be shared among health decision makers, including consumers and patients, to promote improvements in health and healthcare.”
  - The path to a national network of healthcare information is through the successful establishment of Regional Health Information Organizations (RHIO).

- Retrieved from http://www.himss.org/ASP/topics_FocusDynamic.asp?faid=143 on February 24, 2007.

RHIO – Regional Health Information Organization

- Regional Health Information Organization (RHIO) is a multi-stakeholder organization that enables the exchange and use of health information, in a secure manner, for the purpose of promoting the improvement of health quality, safety and efficiency.
- U.S. Department of Health see RHIOs as the building blocks for the national health information network (NHIN). When complete the NHIN will provide universal access to electronic health records.

Retrieved from http://www.himss.org/ASP/topics_FocusDynamic.asp?faid=143 on February 24, 2007. Nahi Chheda (http://www.nahi.com/research)

Goal of NHIN and RHIO's

- Interconnect clinicians so that they can exchange health information using advanced and secure electronic communication.
- Personalize care with consumer-based health records and better information for consumers.
- Improve population health through advanced bio-surveillance methods and streamlined collection of data for quality measurement and research.

- Retrieved from http://www.hhs.gov/asl/testify/t060622a.html on February 24, 2007.

NHIN Sustainability Factor

- A true market can't be made from the top-down approach.

- Widespread electronic medical records use "is really fundamental to making this thing (NHIN) work," said *Micky Tripathi, president and CEO of the Massachusetts eHealth Collaborative.*

HIPAA

- Health Insurance Portability and Accountability Act of 1996 (HIPAA), also known as the Kennedy/Kassebaum Act
- Primary purpose was to improve health insurance accessibility for people changing employers or leaving the workforce
- HIPAA also included "Administrative Simplification" provisions to encourage and protect the electronic transmission of health-related data

What are the HIPAA Administrative Simplification Provisions?

- National standards for electronic data transmission
- Unique health identifiers for providers, employers, plans, and individuals
- Security standards to protect electronically maintained health information
- Privacy and confidentiality provisions for individually identifiable health care data

HIPAA Compliance

- “Software and hardware, in and of themselves, cannot be HIPAA compliant.”
  - They can only aid an organization become HIPAA compliant.
- “HIPAA compliance” is an organizational obligation, not a technical specification.

Cited From:
http://www.hipaadvisory.com/action/Compliance/compliant.htm
Contracting for "HIPAA Compliant" Software and Devices
by John R. Christiansen - Stoel Rives LLP

Who must comply with HIPAA?

- Health care providers or any other person or organization that furnishes, bills, or is paid for health care in its normal course of business
- Health plans that provide or pay the cost of medical care, including Medicare and Medicaid
- Health care clearinghouses that process data elements or transactions

Standardization & Interoperability

- Standardization
  - “The process of establishing standards that are documented agreements containing technical specifications or other precise criteria to be used consistently as rules, guidelines, or definitions of characteristics.”
- Interoperability
  - The ability of two or more systems, or components to exchange information, and to use the information that has been exchanged.
- Retrieved from www.globalvoice.com/index.asp on February 24, 2007.

Need for Standardization

- To create trust and confidence in the health care services
- Increase market relevance
- To facilitate exchange of information
- Help prevent duplication of effort and ensure interoperability between the various technical solutions in health care

Need for Interoperability

- There is a need for transportability that will enable the next provider easy access to the latest patient records.
- There is a need for personal health record (PHR) which contains the patient-entered information.
- There is a need for containment of cost by developing a more systematic approach to healthcare information transportability whereby all disciplines work together towards a documented, integral approach to the individual patient.

Example of Health Care Standards facilitating Interoperability

- CCR – Continuity of Care Records
  - http://www.centerforhit.org/x201.xml
- CDA – Clinical Document Architecture
  - http://www.hl7.org/Library/standards_non1.htm
- CCD – Continuity of Care Document
  - http://en.wikipedia.org/wiki/Continuity_of_Care_Record
- PDF/H – Portable Document Format - Healthcare
  - http://www.aiim.org/article-pr.asp?ID=32097

CCR (Standard)

- The CCR may be used as a vehicle to exchange clinical information among providers, institutions, or other entities.
- It may also be used by the patient as a brief summary of recent care.

CCR Benefits

- The next healthcare provider will not have to search for or guess about a patient's allergies, medications, or current and recent past diagnoses and other pertinent information.
- The next healthcare provider will be informed about the patient's most recent healthcare assessment and services.
- The next healthcare provider will be informed about recommendations of the caregiver who last treated the patient.
- As patient demographics will be provided, time and effort will be saved by not having to repeatedly ask a patient for demographic information in detail. Rather, this information can be more quickly and easily verified.
- A patient's insurance status will be more easily established. Over time, this can be expanded within the system.
- Costs associated with the patient's care will be reduced, for example through avoiding repetitive tests and basic information gathering.
- The effort required to update the patient's most essential and relevant information will be minimized

- Retrieved from http://www.medrecinst.com/press/news/info.asp?id=217 on February 24, 2007.

Certification

- Certification - A certificate is an official document affirming some fact. Certification is the process of obtaining a certificate through a certifying authority.

CCHIT

- CCHIT – Certificate Commission for Health Information Technology

- CCHIT's mission:
  To accelerate the adoption of health information technology by creating an efficient, credible and sustainable product certification program

CCHIT's Goal

- Reduce the risk of HIT investment by physicians and other providers
- Ensure interoperability (compatibility) of HIT products
- Assure the participants that the ROI will be improved quality
- Protect the privacy of patients' personal health information

- Retrieved from http://www.cchit.org

Who would benefit from CCHIT

- Physicians & Hospitals
- Health Systems
- Vendors
- Healthcare consumers (accurate & secure record of health)
- Standards development experts
- Quality Improvement Organizations

Consumer Empowerment

- Consumer Empowerment: The biggest question of the health care industry currently is "Who owns the Patients Data?" The answer to it is not quite simple. Realistically the patient should be the owner of his/her data. How would the current/future health care applications support the question of "Ownership of data?" Will the patient be able to control who is allowed to see his/her medical record?

Population Health

- Biosurveillance (Population Health): Currently there is no real time surveillance for any diseases. Hence Biosurveillance is required. For example: If there is an influenza attack on a particular state/region, the health care communities can submit (real-time) patient data to the state health registry and the state health department would run various algorithms to trigger "Alerts" to the health care officials declaring a state/region wide "Influenza Alert". This will help in early detection of a deadly disease wide spread in a Geographic area. Also, bio-terrorism can be detected in its early stages with the help of Biosurveillance.

Nainil Chheda (About)

- Nainil Chheda, (http://www.nainil.com) MS (MIS) is a Knowledge Research Specialist at eClinicalWorks LLC MA (USA), providing technical coordination services in a web application development environment. In addition, he is responsible for ensuring the overall development of the product in compliance with the various healthcare standards (CCR, CDA) and certifications (CCHIT).

- He specializes in Section 508 Compliance for website usability and design. In addition he specializes in change management, task co-ordination, process improvement and identifying and addressing organizational concerns. He also consults to firms in the healthcare industry, as well as the web hosting industry.

- He is a frequent attendant at the nationwide healthcare conferences and various standards and interoperability committee meetings. His most recent research concentrates on the aspects of the game theory in application towards finding equilibrium in the healthcare industry. His research concerns reaction from electronic health record (EHR) vendors, healthcare providers, end-user issues in medical informatics.

- Nainil has written a variety of healthcare and information system research papers and presentations.

- He holds a Masters (in MIS) from the Temple University (PA, USA) and a B.Com from Mumbai University (Maharashtra, INDIA). He has research interest in the Game Theory and the Governing Dynamics of the Internet.

Nainil Chheda (Professional Affiliation)

- Member of AMIA (American Medical Informatics Association) - (2007 to present)
- Member of AIIM (Association for Information and Image Management) - (2007 to present)
- Member of Technical Work Group (Marketing) for PDF-H (Portable Document Format - Healthcare) - (2006 to present)
- Member of PHR SIG (Patient Health Record Special Interest Group) - (2006 to present)
- Member of CEND (Consumer Empowerment National Demonstration) - (2006 to present)
- Member of Technical Work Group for ASTM (American Society for Testing and Materials) - Subcommittee E31 - CCR (Continuity of Care Records) - (2005 to present)
- Member of EHRVA (Electronic Health Records Vendor Association) - (2005 to present)
- Member of ANSI (American National Standards Institute) HITSP (Health Information Technology Standards Panel) - (2005 to present)
- Member of AIS (Association for Information Systems) - (2004 to present)
- Member of ACM (Association of Computer Machinery) - (2004,2006 - present)
- Member of Kshana (Social Organization) - (2002 to present)
- Former member of InterGov (Internet Government)

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